

*** Programs on singly linear linked list(25 Programs):**

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Linked list structure :

```
struct node {  
  
    int no;           // Data element  
    struct node *next, // Address of next node  
};
```

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Program 1. Write a program which add new node in singly linear linked list at first position.

Function Prototype :

```
int InsertFirst(  
    struct node **Head, int no  
);
```

Input linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|

Input data element : 21

Output linked list : |21|->|10|->|20|->|30|->|40|->|50|->|60|->|70|

Program 2. Write a program which add new node in singly linear linked list at last position.

Function Prototype :

```
int InsertLast(  
    struct node **Head, int no
```

);

Input linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|

Input data element : 21

Output linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|->|21|

Program 3. Write a program which add new node in singly linear linked list at specified position.

Function Prototype :

```
int InsertAtPosition(  
    struct node **Head, int no, int pos  
);
```

Input linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|

Input data element : 21

Input position : 4

Output linked list : |10|->|20|->|30|->|21|->|40|->|50|->|60|->|70|

Program 4. Write a program which remove first node from singly linear linked list.

Function Prototype :

```
int DeleteFirst(  
    struct node **Head  
);
```

Input linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|

Output linked list : |20|->|30|->|40|->|50|->|60|->|70|

Program 5. Write a program which remove last node from singly linear linked list.

Function Prototype :
int DeleteLast(
 struct node **Head
);

Input linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|
Output linked list : |10|->|20|->|30|->|40|->|50|->|60|

Program 6. Write a program which remove node from singly linear linked list which is at specified position.

Function Prototype :
int DeleteAtPosition(
 struct node **Head, int pos
);

Input linked list : |10|->|20|->|30|->|40|->|50|->|60|->|70|
Input position : 4
Output linked list : |10|->|20|->|30|->|50|->|60|->|70|

Program 7. Write a program which displays contents of singly linear linked list.

Function Prototype :
int Display(
 struct node *Head
);

Program 8. Write a program which search first occurrence of particular element from singly linear linked list.

Function should return position at which element is found.

Function Prototype :

```
int SearchFirstOcc(  
    struct node *Head, int no  
);
```

Input linked list : |10|->|20|->|30|->|40|->|50|->|30|->|70|

Input element : 30

Output : 3

Program 9. Write a program which search last occurrence of particular element from singly linear linked list.

Function should return position at which element is found.

Function Prototype :

```
int SearchLastOcc(  
    struct node *Head , int no  
);
```

Input linked list : |10|->|20|->|30|->|40|->|50|->|30|->|70|

Input element : 30

Output : 6

Program 10. Write a program which search second last occurrence of particular element from singly linear linked list.

Function should return position at which element is found.

Function Prototype :

```
int SearchSecLastOcc(  
    struct node *Head , int no
```

);

Input linked list : |10|->|20|->|30|->|40|->|30|->|30|->|70|

Input element : 30

Output : 5

Program 11. Write a program which searches all occurrence of particular element from singly linear linked list. Function should return number of occurrence of that element.

Function Prototype :

```
int SearchAll(  
    struct node *Head , int no  
);
```

Input linked list : |10|->|20|->|30|->|40|->|30|->|30|->|70|

Input element : 30

Output : 3

Program 12. Write a program which accept two singly linear linked list from user and concat source linked list after destination linked list.

Function Prototype :

```
int ConcatList(  
    struct node **Src , struct node **Dest  
);
```

Input source linked list : |30|->|30|->|70|

Input destination linked list : |10|->|20|->|30|->|40|

Output destination linked list : |10|->|20|->|30|->|40|->|30|->|30|->|70|

Program 13. Write a program which accept two singly linear linked list from user and concat first N elements of source linked list after destination linked list.

Function Prototype :

```
int ConcatFirstN(  
    struct node **Src ,struct node **Dest, int no  
);
```

Input source linked list : |30|->|30|->|70|

Input destination linked list : |10|->|20|->|30|->|40|

Input number of elements : 2

Output destination linked list : |10|->|20|->|30|->|40|->|30|->|30|

Program 14. Write a program which accepts two singly linear linked list from user and concat last N elements of source linked list after destination linked list.

Function Prototype :

```
int ConcatLastN(  
    struct node **Src ,struct node **Dest, int no  
);
```

Input source linked list : |30|->|30|->|70|

Input destination linked list : |10|->|20|->|30|->|40|

Input number of elements : 2

Output destination linked list : |10|->|20|->|30|->|40|->|30|->|70|

Program 15. Write a program which accepts two singly linear linked list from user and also accept range and concat elements of source singly linear linked list from that range after singly linear destination linked list.

Function Prototype :
int ConcatListRange(
 struct node **Src, struct node **Dest , int start , int
end);

Input source linked list : |30|->|30|->|70|->|80|->|90|->|100|
Input destination linked list : |30|->|40|
Input starting range : 2
Input ending range : 5
Output destination linked list : |30|->|40|->|30|->|70|->|80|->|90|

Program 16. Write a program which copies contents of source singly linear linked list to singly linear destination linked list.

Function Prototype :
int LLCopy(
 struct node **Src, struct node **Dest
);
Input source linked list : |30|->|30|->|70|->|80|->|90|->|100|
Input destination linked list : Empty (NULL)
Output destination linked list : |30|->|30|->|70|->|80|->|90|->|100|

Program 17. Write a program which copies first N contents of singly linear source linked list to destination singly linear linked list.

Function Prototype :

```
int LLNCopy(  
    struct node **Src , struct node **Dest, int no '  
);
```

Input source linked list : |30|->|30|->|70|->|80|->|90|->|100|

Input destination linked list : Empty (NULL)

Input no : 4

Output destination linked list : |30|->|30|->|70|->|80|

Program 18. Write a program which copies last N contents of source singly linear linked list to destination singly linear linked list.

Function Prototype :

```
int LLINCopy(  
    struct node **Src , struct node **Dest , int no  
);
```

Input source linked list : |30|->|30|->|70|->|80|->|90|->|100|

Input destination linked list : Empty (NULL)

Input no : 4

Output destination linked list : |70|->|80|->|90|->|100|

Program 19. Write a program which copies contents of source singly linear linked list to destination singly linear linked list which lies between the particular range'
which is accepted from user.

Function Prototype :

```

int LLCopyRange(
    struct node **Src, struct node **Dest, int start, int
end
    );

```

Input source linked list : |30|->|30|->|70|->|80|->|90|->|100|

Input destination linked list : Empty (NULL)

Input starting range : 2

Input starting range : 5

Output destination linked list : |30|->|70|->|80|->|90|

Program 20. Write a program which copies alternate contents of source singly linear linked list to destination singly linear linked list.

Function Prototype :

```

int LLCopyAlt(
    struct node **Src, struct node **Dest
    );

```

Input source linked list : |30|->|30|->|70|->|80|->|90|->|100|->|110|

Input destination linked list : Empty (NULL)

Output destination linked list : |30|->|70|->|90|->|110|

Program 21. Write a program which copies contents of source singly linear linked list whose addition of digits is even number to destination singly linear linked list.

Function Prototype :

```

int LLCopyEx(

```

```
        struct node **Src , struct node **Dest  
    );
```

Input source linked list : |30|->|33|->|73|->|80|->|90|->|100|->|110|

Input destination linked list : Empty (NULL)

Output destination linked list : |33|->|77|->|110|

Program 22. Write a program which copies contents of source singly linear linked list whose addition of digits is prime number to destination singly linear linked list.

Function Prototype :

```
int LLCopyEx(  
    struct node **Src , struct node **Dest  
);
```

Input source linked list : |30|->|32|->|73|->|80|->|70|->|110|->|112|

Input destination linked list : Empty (NULL)

Output destination linked list : |30|->|30|->|70|

Program 23. Write a program which accept source singly linear linked list and destination singly linear linked list and check whether source list is sub list of destination list. Function returns first position at which sub list found.

Function Prototype :

```
int SubList(  
    struct node **Src, struct node **Dest  
);
```

Input source linked list : |73|->|80|->|70|
Input dest list: |10|->|73|->|80|->|17|->|22|->|73|->|80|->|70|->|21|
Output : First Sub list found at position 6

Program 24. Write a program which accept source singly linear linked list and destination singly linear linked list and check whether source list is sub list of destination list. Function returns last position at which sub list found.

Function Prototype :
int SubList(
 struct node **Src , struct node **Dest
);

Input source linked list : |73|->|80|->|70|
Input dest list: |10|->|73|->|80|->|70|->|22|->|73|->|80|->|70|->|21|
Output : Last Sub list found at position 6

Program 25. Write a program which accept source singly linear linked list from user and copy the contents into destination singly linear linked in ascending order.

Function Prototype :
int CopyAsc(
 struct node **Src , struct node **Dest
);

Input source linked list : |110|->|73|->|10|->|80|->|70|->|12|
Input destination linked list: Empty (NULL)
Output destination linked list: |10|->|12|->|70|->|73|->|80|->|110|